



Development of a Recycling Program

A Melding of Law, Grassroots, and Environmental Champions

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NASA JOHNSON SPACE CENTER

WHITE SANDS TEST FACILITY



NASA White Sands Test Facility



- In Las Cruces, NM
- Federal facility built early 1960s
- Aerospace testing incl. Hazardous Materials
- Current Pop. approx. 600
- Multi-departmental, Environmental Department formed early 1980s





Recycling by Mandate...

- 1976 RCRA - EPA encourages recycling
- 1993 Executive Order (E.O.) 12873 - Clinton orders all federal agencies to make recycling part of daily activities
- 1998 E.O. 13101 - Clinton orders all federal agencies to commit to recycling and buying recycled-content and environmentally preferable products.

WSTF is basically recycling what's required: Scrap metal, spent batteries, spent solvents, used oil, and white paper.

Note: WSTF is involved in many other required environmental stewardship activities, but for purposes of this talk the focus is on recycling only.

Early Days (~ 1985 – 2000)



Desired Behavior	Challenges	Solutions
Compliance with Environmental Law and Presidential Executive Orders	<ul style="list-style-type: none">• E.O. info slow to trickle down• Weak enforcement• Major change - slow starting• Decentralized responsibilities• Interpretation of law and E.O.s• No infrastructure to support recycling• Reporting	<ul style="list-style-type: none">• Centralized responsibility (Env. Dept.)• Env. law Interpretation experts• Developed (primitive) collection areas• Identified vendors for recyclables• Started monitoring and measuring recyclables• RCRA Training for recyclables



Required recycling stirs other ideas in a few, resulting in the grassroots movement at WSTF...

- Voluntary plastic bottle collection
- Voluntary shredded paper donated to animal shelter
- Voluntary community donations (old computers, etc.)
- Collaboration with City of Las Cruces for white paper recycling



Major Milestone in 2000...

- 2000 E.O. 13148 – Clinton orders all federal agencies to make environmental management part of everyday management
- 2000 WSTF develops an Environmental Management System (EMS; ISO 14001)
- Say it, Do it, Prove it (in the audit!), much stronger enforcement
- Continual Improvement



Early 2000s WSTF assesses Environmental Impacts

- Use of Natural Resources
 - Materials Management
 - Foster relationship with Logistics
- Water & Energy Conservation
 - Appoint Energy Manager

Meanwhile, in 2001, Bush orders (E.O. 13221) use of energy efficient devices (Energy Star)

Growth & Development (2000-2015)



2005 – Another major milestone...Energy Manager formalizes the WSIT (WSTF Sustainability Initiative Team). Team focus = raise site awareness for energy conservation. Team Leader researches “Green” E.O.s, WSTF not on track.

2006 – Under ISO 14001, Environmental Program for Sustainability is launched. WSIT focus broadened to encompass all Green E.O. requirements.

Meanwhile...in 2007, E.O. 13423, Bush orders government agencies to implement recycling programs & increase diversion solid waste.

Recycling takes off!



WSIT brings to Recycling Program:

- Site awareness training
- Recycling improvement ideas
- Recycling incentives, awards, and events

The recycling program is the most developed Environmental Program at this time, followed by energy/water management, then green purchasing.



Meanwhile...

2009 - E.O. 13514, Obama orders federal agencies to operate sustainably, sustainability goals set, includes reducing waste 50% recycling and waste diversion by 2015.

2015 - E.O. 13693, Obama orders federal agencies to improve Environmental Performance, refinement of goals, advance waste prevention by diverting food waste and compostables, construction and demolition (C+D), and any other creative ideas.



WSIT Accomplishments:

- Collaborated with NMSU recycling program until new solid waste contract in 2012 (recycling more than CLC), added C+D.
- Great partnership with Logistics who support recycling and repurposing.
- Petitioned WSTF management for building space to make a site recycling center.
- Became an officially recognized WSTF Team, able to work with various NASA boards and manage Green Projects process.



WSIT Accomplishments (cont'd):

- Asphalt/concrete/wood chipping project.
- MOA with Unicore for electronics recycling.
- Recycling station upgrades.
- Found recyclers of Kevlar.
- Community involvement; member of South Central Solid Waste Authority (SCSWA) Recycling Committee, helped get city recycling going, glass recycling.

Growth & Development (2000-2015)



Clockwise: Solar Belly at Entry Gate,
WSIT logo, WSTF Recycling Mascot



Growth & Development (2000-2015)



Asphalt & Concrete Grinding, Wood Chipping Project



Growth & Development (2000-2015)



Recycling with NMSU, Electronics recycling with Unicore, Donation of materials to local high schools



Growth & Development (2000-2015)



Recycling Station Upgrade Project

← Before

After →



Growth & Development (2000-2015)



Incentives, Awards, and Initiatives:

- Get Caught Recycling
- Quarterly Green Star Award
- Pledge to Recycle
- Kick the Can





Items currently recycled...

- Batteries (all types)
- Chemicals (8)
- Construction Materials (10)
- Electronics/Lamps (7)
- Fluids, Used Petroleum (5)
- Food Grease
- Metals (12)
- Misc. (10)(bar soap to Fire extinguishers to Yard Waste)
- Office Supplies (6)
- Paper (all types)
- Peacekeeper Missiles
- Plastics (8)
- Single Stream Material
- Space Shuttle (fuel Cells)
- Vehicle, oil filters, and tires



With the help of WSIT, WSTF has reached above and beyond their recycling requirements...

Year	Total Recyclables	Solid Waste Diversion
2000	70,380 lbs	12%
2015	2,897,872 lbs	94%
15 Year Total	31,262,069 lbs	83%

Growth & Development (2000-2015)



Desired Behavior	Challenges	Solutions
<ul style="list-style-type: none">• Employees aware recycling, reusing, reducing is part of WSTF daily operations.• Knowledgeable of which solid waste items can be recycled and which cannot.• Which C+D items can be recycled and what cannot.• Proper use of recycling receptacles	<ul style="list-style-type: none">• Negative attitudes.• Resistance to change.• Management support shifts.• Funding.• Stakeholder interest.• Re-purposing property.• Federal Property Rules.	<ul style="list-style-type: none">• Focused Green Team, WSIT, to oversee recycling.• Raise awareness, raise awareness, raise awareness.• Training, training, training (recycling in new hire briefing, required annual training classes).• Informative pamphlets at recycling stations.• Professional looking recycling stations.

Looking to the Future...2016 & Beyond



Recycling is not just an Environmental Department function...it's everybody's business

Desired Behavior	Challenges	Solutions
<ul style="list-style-type: none">• Site-wide input for new recycling ideas.• More accountability for other departments.• Recycle more, capture metrics for reporting.• Deepen recycling and sustainability mindset.	<p>Management buy-in (employees have great ideas).</p> <p>Finding advocates other than WSIT members.</p> <p>Funding.</p>	<ul style="list-style-type: none">• Formed Site-wide Sustainability Working Group (S2WG).• Supported under an ISO EMP.• Funded for 1 year.• Made computer tool for recording ideas, assigning advocates, and capturing metrics.

Summary of Recycling Program



- Started early, forced by Federal Environmental Law and E.O.s
 - Beginning framework.
 - E.O.s develop with time; more commitment, specificity, and accountability through reporting requirements.
- Mandates “encourage” Environmental Champions and grassroots efforts outside of mandates are made.
- Made stronger with site's commitment to good environmental stewardship.
 - ISO 14001 EMS
 - Formalized programs
 - Auditable
 - Continual improvement (going above & beyond)

Summary of Recycling Program



- Focused, funded, trained green team: WSIT
- Move from a primitive recycling infrastructure to professional looking recycling stations and a Recycling Center.
- Behaviors changed from blind compliance to exceeding requirements to doing what is right for human health and the environment.

Come full circle - started in several departments, responsibility moved to Env. Dept., now being pushed back out to other departments; S2WG

Summary of Recycling Program



Hard work has paid off...

Awards

- NMRC Federal Facility Award in 2010 – work with SCSWA in getting Electronics Recycling.
- EPA's Federal Green Challenge Award in 2014 – asphalt/concrete/wood chipping project.
- New Mexico Recycling Coalition Recycling Innovation Award in 2014 – Space Shuttle Fuel Cell Precious Metal Reclamation & Recycling.

Summary of Challenges



- Federal Bureaucracy – Things take time.
- Keeping up with “Green” orders from the President.
 - Every few years, revocations, crossroad documents, etc.
- Getting information by “Trickle-down.”
- Management support and funding.
 - It's a space program for Pete's sake!
 - strategic insertion into high profile programs.
- Changing WSTF cultural mindsets.
- Creativity – What more can we do?



“Very great change starts from very small conversations, held among people who care. The conversation should not be based on politics nor complaint, but on both passion and a sense of hope.”
- Margaret Wheatley

“Never underestimate the power of a small group of committed people to change the world. In fact, it is the only thing that ever has.”
- Margaret Mead